

U.S. Patent Application No. 10/731,420  
Amendment and Reply dated July 26, 2007  
In Response to Office Action dated March 26, 2007

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-23 (canceled)

24. (Currently amended) An analytical system comprising:

a substrate including

(1) a central reservoir region,

(2) a plurality of electrophoretic channels in fluid communication with, and emanating substantially radially from, the central reservoir region, the channels being coplanar with each other, and each channel having (i) a proximal end which is linked to the central reservoir region, and (ii) a distal end, and

(3) ~~for each channel one or more chambers that are each linked by a passageway in fluid communication with the distal end of that channel~~ a first chamber that is linked by a first passageway to a first of the plurality of electrophoretic channels, and

(4) a second chamber that is linked by a second passageway to a second of the plurality of electrophoretic channels;

~~wherein each passageway leads from each chamber in a direction that is initially away from the central reservoir region;~~

a mechanism for rotating the substrate about a central axis of rotation that is perpendicular to the plane of the channels; and

a plurality of electrodes for applying a voltage potential between the one or more chambers

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and the central reservoir region.

25. (Previously presented) The analytical system of claim 24, whereby centrifugation of the substrate about the central axis is effective to disperse liquid from the central reservoir region into the channels and the one or more chambers such that any air bubbles in the one or more chambers, the channels, and the passageways are forced towards the axis of rotation, when such liquid is present in the central reservoir region.

26. (Previously presented) The analytical system of claim 24, further comprising a contact card adapted to supply separate electrical voltages to the electrodes.

27. (Previously presented) The analytical system of claim 24, further comprising:  
conductive concentric rings in electrical contact with the electrodes; and  
conductive brushes which remain in contact with the concentric rings, when the substrate is rotated.

28. (Previously presented) The analytical system of claim 24, further comprising a voltage source adapted to independently control each of the plurality of electrodes.

29. (Previously presented) The analytical system of claim 24, further comprising a detector for detecting selected components which may be present in one or more of the channels.

30. (Previously presented) The analytical system of claim 29, wherein the mechanism for

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rotating the substrate about the central axis is adapted to sequentially pass the channels by the detector, for detecting one or more components that may be present in the channels.

31. (Previously presented) The analytical system of claim 24, wherein said chambers are defined in part by an annular septum that covers the chambers and permits needle-access to the chambers for delivery of liquid to the chambers.

32. (Currently amended) The analytical system of claim 24, wherein said chambers are defined in part by an annular ~~septum~~ cover that is porous to air, such that displaced air escapes through the annular cover when liquid is loaded into the channels.

33. (Previously presented) The analytical system of claim 24, wherein at least one of the channels contains an electrophoresis medium.

34. (Previously presented) The analytical system of claim 24, wherein the channels have cross-sectional diameters between 1  $\mu\text{m}$  and 100  $\mu\text{m}$ .

35. (Previously presented) The analytical system of claim 24, further comprising a temperature controller adapted to selectively heat or cool on or more surfaces of the substrate.

36. (Previously presented) The analytical system of claim 35, wherein the temperature controller is adapted to heat the one or more chambers of each channel.

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37. (Previously presented) The analytical system of claim 24, wherein the substrate comprises a material comprising at least one of copper, aluminum, glass, silica-based glass, quartz, and polycarbonate.

38. (Previously presented) The analytical system of claim 24, wherein the substrate further comprises electrical resistive traces in thermal contact with the one or more chambers of each channel.

39. (Previously presented) The analytical system of claim 24, wherein the mechanism comprises a motor shaft to rotate the substrate, and wherein the motor shaft is electrically grounded and adapted to be in communication with a liquid disposed in the central reservoir region.